

# A new genus and species of dromiid crab (Brachyura, Dromiidae) from the Timor Sea, North-West Australia with records of other species from the China Sea

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## ABSTRACT

A new genus and species of dromiid crab, *Alainodromia timorensis*, is described from the Holothuria Bank, Timor Sea, based on specimens collected by HMS *Penguin* in 1892. Collections from the Holothuria Bank and the Macclesfield Bank, in the China Sea, during the period 1888-1893 by the Royal Navy survey vessels, HMS *Rambler*, *Penguin* and *Egeria* also included the following dromiid crabs: *Lauridromia intermedia* (Laurie, 1906), *Dromiodopsis tridentata* Borradaile, 1903, *Petalomera granulata* Stimpson, 1858, *Cryptodromiopsis bullifera* (Alcock, 1900), *C. unidentata* (Ruppell, 1830), *Cryptodromia bilgendorfi* De Man, 1888, and *Epigodromia areolata* (Ihle, 1913). *Petalomera acutidens* Sakai, 1983 is shown to belong to the genus *Epigodromia* McLay, 1993.

## KEY WORDS

Crustacea,  
Decapoda,  
Dromiidae,  
new genus,  
*Alainodromia*,  
new species,  
China Sea.

## RÉSUMÉ

Un nouveau genre et une nouvelle espèce de dromie (Brachyura, Dromiidae) de la mer de Timor, au nord-ouest de l'Australie et signalement d'autres espèces de la mer de Chine. Un nouveau genre et une nouvelle espèce de Dromiidae, *Alainodromia timorensis*, sont décrits du banc Holothuria, en mer de Timor, à partir de spécimens récoltés par le HMS *Penguin* en 1892. Les collections provenant du banc Holothuria et du banc Macclesfield, en mer de Chine, prélevés en 1888-1893 par les bateaux de la Royal Navy HMS *Rambler*, *Penguin* et *Egeria*, contiennent aussi les Dromiidae suivants : *Lauridromia intermedia* (Laurie, 1906), *Dromiodopsis tridentata* Borradaile, 1903, *Petalomera granulata* Stimpson, 1858, *Cryptodromiopsis bullifera* (Alcock, 1900), *C. unidentata* (Ruppell, 1830), *Cryptodromia bilgendorfi* De Man, 1888, et *Epigodromia areolata* (Ihle, 1913). Il est montré que *Petalomera acutidens* Sakai, 1983 appartient au genre *Epigodromia* McLay, 1993.

## MOTS CLÉS

Crustacea,  
Decapoda,  
Dromiidae,  
nouveau genre,  
*Alainodromia*,  
nouvelle espèce,  
mer de Chine.

## INTRODUCTION

A new genus and species of dromiid crab is described from the Holothuria Bank (13°25'S - 126°00'E) in the Timor Sea near Vansittart Bay, Kimberley, north-west of Australia. The specimens were collected in 1892 by P. Bassett-Smith Surgeon RN, aboard HMS *Penguin* during its cruise in the Australian and China Seas. The Stomatopoda material from this cruise were reported by Pollock (1893). While station information and a preliminary report, focussing mainly on the corals, from the Macclesfield Bank, off the coast of Vietnam (15°40'N - 114°45'E), was presented to the Admiralty by Bassett-Smith (1894), nothing seems to have been reported about the results of dredging on the Holothuria Bank. This area was investigated en route to or from the China Sea. Besides the new species described herein, I also include a list of other dromiids collected from the Holothuria Bank as well as dromiids from the Macclesfield Bank. All of the material reported in this paper is held in the Crustacea collection of the British Museum (BM), London. It is interesting to note that if the dromiid material had been worked up at the same time as the stomatopods, five new species, and as many genera, would have been discovered.

The report by Bassett-Smith (1894) is divided into three parts: Part I lists the stations occupied by HMS *Rambler* (during April, 1888) from stations A to I, Part II lists the stations occupied by HMS *Penguin* (during April, 1892) from stations 1 to 32, and Part III lists the stations occupied by HMS *Egeria* (during April, 1893) from stations 33 to 77. This makes a total of eighty-seven Macclesfield Bank stations which were sampled using dredges and "swabs". While most of the material collected on the first survey in 1888 was listed as corals and sponges, crabs were recorded from stations A, F, and I. In Part II, a footnote mentions a report by Commander W. U. Moore and P. W. Bassett-Smith about the "[...] dredgings obtained on this bank (*i.e.* Macclesfield) by HMS *Rambler*, in 1888, published by the Hydrographic Department of the Admiralty, in March 1889, under the title of 'Reports of the Results of an examina-

tion by the officers of HMSV *Rambler* of the slopes and zoological condition of the Tizard and Macclesfield Banks". I have not had the opportunity of consulting this report, but there does not seem to have been any dromiid material collected on the first cruise. On the second survey, in 1892, crustaceans were described as "[...] not plentiful, though among the coral forms, their appearance and shape was often most grotesque and generally strongly protective, those coloured green and red, like the algae in which they lived, even having white irregular spots on them resembling spirorbis shells, etc., others completely hidden in a sponge much larger than themselves which they carried about, or some species of lambris (*sic.*) so entirely like a rocky bottom, that when still it was almost impossible to detect them". This is the only specific reference to sponge crabs (Dromiidae) collected during the second voyage. On the third survey, Brachyura are mentioned for stations 39, 56, 59, 64, and 76. These include a parasitic crab from a *Cidaris* urchin (station 56), and large spider crabs (stations 59, 76). At station 39 "[...] three species of *Dromia*" carrying large sponges on their back" and at station 64 a species of *Dromia* was said to be common. Thus for all the Macclesfield Bank stations dromiids are mentioned only three times.

When the Brachyura collection from these voyages was lodged at the British Museum, the only information included on the labels was the name of the collector (Bassett-Smith), the name of the ship, and the depth (these have been converted from fathoms to metres) along with the accession number. Sometimes the type of bottom was included. Since station numbers from the Macclesfield Bank survey were not included, it is not possible to relate the specimens back to station information with any certainty. The depths which were recorded on the labels do not seem to correspond to the station data. As noted above, the collection from station 39 was reported to contain three species of *Dromia*. The only sample which contained three dromiid species was No.: 98. 8. 20. 99-110 but the label information does not agree with the information given in the report. However, the label information does agree with station 64

where the report states that a species of "*Dromia*" was common. Therefore I tentatively suggest that some records for *Lauridromia intermedia* (Laurie, 1906), *Petalomera granulata* Stimpson, 1858, and *Cryptodromiopsis bullifera* (Alcock, 1900) may have come from station 64. Linking any of the other specimens with particular stations would be purely speculative. There does not seem to be any data available for the Holothuria Bank stations.

Besides mapping the bathymetry of the Macclesfield Bank, for shipping purposes, the other purpose of the voyage seems to have been to test Darwin's theory about the origin and distribution of coral reefs (Darwin, 1842). Hence the interest of Bassett-Smith in the corals, especially reef-building species. The survey established that the Bank was about 80 miles (130 km) long by 30 miles (50 km) wide with a periphery 200 miles (320 km) long. In his Preface to Bassett-Smith's report, the chief hydrographer, W. J. L. Wharton stated that on the periphery "[...] there exists a rim of coral in luxuriant growth, and at a remarkably even depth below the surface of from 9 fms (17 m) to 14 fms (26 m), this rim being broken here and there by passages of greater depth, but less than the general depths of from 40 fms (73 m) to 48 fms (88 m), which prevail over the whole central body of the bank". He concluded by stating "[...] that from the present time onwards no movement (of the bottom) is necessary in order to form in the future a perfect atoll, the simple growth of coral on the rim sufficing; and that we may have here an instance of a suitable original foundation for an atoll so formed, as pointed out by Mr. Darwin".

The terminology and method of presentation used in this paper follows that of McLay (1993), where the full synonymies for each species can be found. The original name and the synonymies given below encompass all the important nomenclatural decisions along with references to published records of specimens already reported from the Macclesfield and Holothuria Banks areas. The only exception is *Petalomera granulata* Stimpson, 1858 which was not included in McLay (1993) and so a full synonymy for this species is included herein.

## Family DROMIIDAE De Haan, 1833

### *Alainodromia* n.g.

TYPE SPECIES. — *Alainodromia timorensis* n.sp., by monotypy.

ETYMOLOGY. — This new generic name combines "*Dromia*" with the christian name of Dr Alain Crosnier, in recognition of his immense contribution to the study of decapod Crustacea. Gender feminine.

### DIAGNOSIS

Carapace about as wide as long (including rostral and anterolateral teeth), surface weakly convex, granulate and/or tuberculate. Rostrum strongly tridentate, projecting, supraorbital margin well developed. Anterolateral teeth well-developed, some may be bifid, on a much higher level than the rostrum. Coxae of third maxillipeds close together and inserted on the sternal plate which begins just in front of the bases of the chelipeds. Female sternal grooves end close together but separately between bases of first walking legs. Antennal exopod well-developed. Cheliped without an epipod, male chelipeds much larger than those of female. First two pairs of walking legs slightly smaller than chelipeds, tuberculate, dactyli well-developed, inner margins armed with small spines. Last two pairs of legs stout, reduced, dactyli strongly curved, inner propodal margin with single spines, no spines on outer propodal margins. Abdomen of six free segments, strongly ridged and tuberculate. Uropod plates absent. Abdominal locking mechanism involves lateral tubercles on penultimate segment locking in front of tubercles on the base of the first walking legs. Corners of posterior telson margin produced.

### DISCUSSION

*Alainodromia timorensis* n.sp. resembles some of the species belonging to *Takedromia* McLay, 1993, but differs in several important respects. The most distinctive characters of *Alainodromia* n.g. are the approximately pentagonal carapace shape, prominent rostral area, strongly developed, elevated anterolateral teeth, strongly sculptured abdomen and absence of the uropod plates. In addition, the female sternal grooves are

convergent, ending close together. This genus clearly belongs in the group of genera which lack an epipod on the cheliped, such as *Cryptodromia* Stimpson, 1858, *Takedromia* McLay, 1993, and *Epigodromia* McLay, 1993. All of the species belonging to these genera only attain a relatively small size. While the species of *Takedromia* and *Epigodromia* have probably abandoned the habit of carrying pieces of camouflage, the structure of the last two pairs of legs in *A. timorensis* n.sp. suggests that, like the species of *Cryptodromia*, it still employs this habit. The new genus shares with *Takedromia* and *Epigodromia*, and some other dromiids, the characteristic that the chelipeds are strongly sexually dimorphic, being much larger in the male.

*Alainodromia timorensis* n.sp.  
(Figs 1-3)

**MATERIAL EXAMINED.** — **Holothuria Bank.** HMS *Penguin*, 13°25'S - 126°00'E, 44 m, 1892, coll. P. W. Bassett-Smith: 2 ♂♂, 11.8 × 11.0 mm (holotype, BM 1998: 193), 12.7 × 11.6 mm (paratype, broken, BM 1998: 194). — 27.5 m, no date: 1 ♀ 6.4 × 6.1 mm, 1 ♂, 8.7 × 8.4 mm, both carrying sacculinid parasite externa under the abdomen (BM 1892: 3: 26: 224-225).

**DESCRIPTION**

Carapace broadly subpenragonal in shape, wider than long, more strongly convex in the anterior-posterior direction, laterally almost flat, surface covered with fine granules, anterior half adorned with about forty larger subacute tubercles bearing long setae. Regions of the carapace weakly defined. Short frontal groove extends back between lateral rostral teeth. Branchial and cervical grooves distinct. Protogastric region with three small tubercles, mesogastric region with seven unequal tubercles, and branchial region with about ten unequal tubercles. Cardiac area slightly convex, finely granulated, well-defined by grooves. Rostrum strongly tridentate, teeth separated by a broad U-shaped sinus, median tooth deflexed but visible dorsally, lateral teeth larger, prominent, directed anteriorly, slightly longer than median tooth. Anterolateral margin with three teeth, begins well behind post-orbital corner, rising quickly to a large antero-dorsally

directed tooth which is flattened and bears two or three small tubercles on its posterior margin, followed by a bifid dorso-laterally directed tooth marking the widest part of the carapace, and then the third anterolateral tooth which is flattened like the first tooth and directed laterally. There is some variation in the anterolateral teeth because either of the first two teeth may or may not be bifid. Branchial notch not distinct, posterolateral margins convergent, bearing two or three well-developed tubercles. Posterior carapace margin almost straight. The anterolateral teeth and tuberculated area of the carapace are on a higher level than the rostral area.

Supraorbital border extends back from posterior margin of lateral rostral tooth to a strong supraorbital tooth which is directed almost vertically, remaining supraorbital margin slightly sinuous towards a small postorbital tooth. No orbital fissure, suborbital margin not visible dorsally, finely granulated, with a small tooth near the inner corner.

First segment of antenna much wider than long, granulate, medially beaked, superior lobe longer and bearing several small spines. Second segment longer than wide, convex, granulate, distomedial corner produced as a blunt curved lobe on which third segment is inserted at an angle. Exopod firmly fixed to second segment, granulate, extending beyond joint between third and fourth segments, tip slightly bilobed to accommodate fourth segment of antenna, inner border curved over base of eyestalk. Ratio of length of antennal flagella/CW = 0.56.

Subhepatic area slightly convex, with two small tubercles beneath the first anterolateral tooth and a row of three flattened tubercles curving posteriorly below these. This row of tubercles is on the same level as the anterior margin of the buccal frame. A shallow groove extends around below these tubercles to the branchial groove. Female sternal grooves end close together, but apart on a convex, transverse ridge between bases of first legs. Crista dentata on third maxillipeds armed with about eight similar small spines.

Chelipeds finely granulated, well-developed, much larger in male (length about twice CL), covered in sharp granules. Mucus especially long in male, inferior margins bearing several small

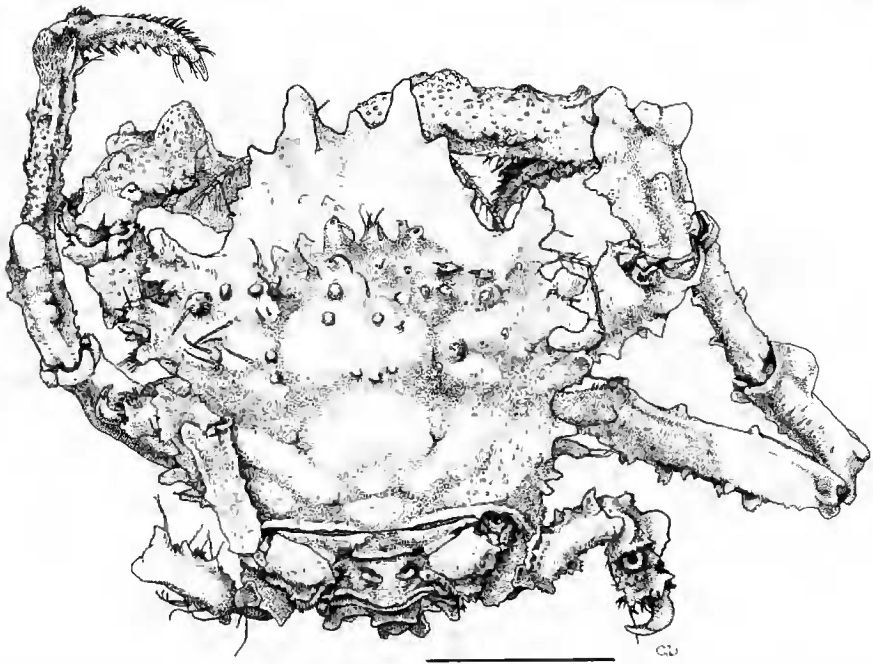
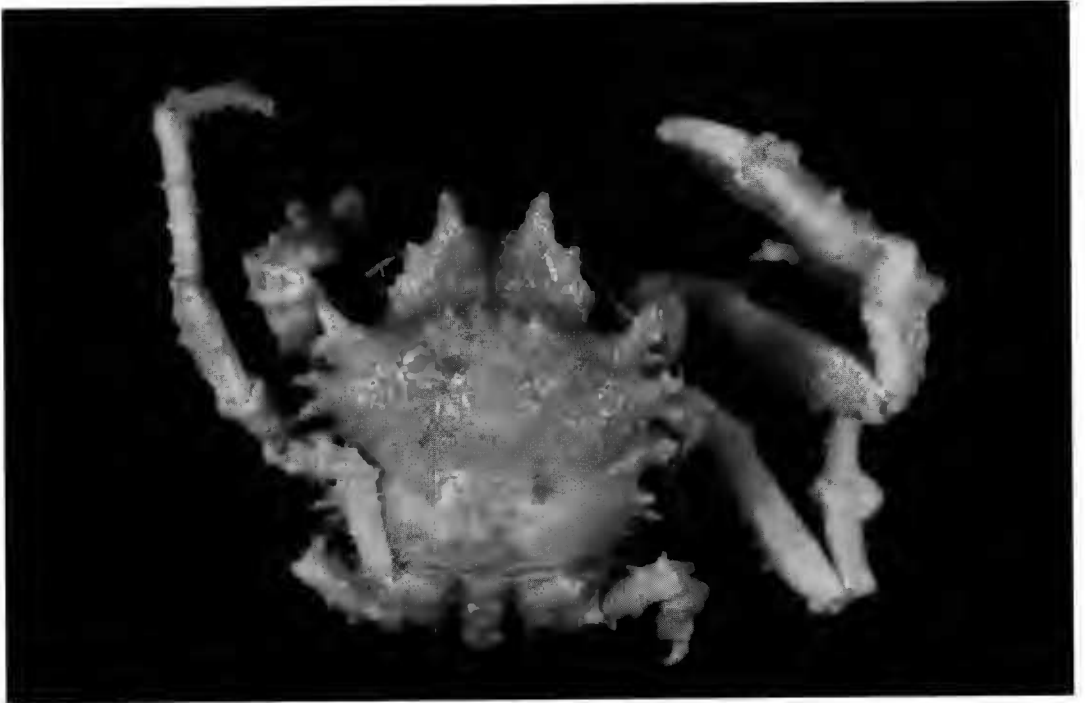


FIG. 1. — *Alaiodromia timorensis* n.sp., Holothuria Bank, HMS *Penguin*, 13°25'S - 126°00'E, 44 m, 1892: ♂ holotype 11.8 × 11.0 mm (BM 1988. 193), dorsal view of whole crab (left and right second walking legs, and right fourth leg missing). Scale bar for drawing: 5 mm.

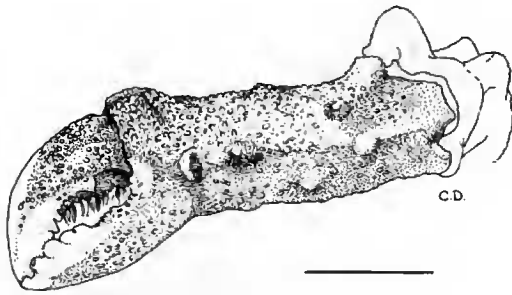


FIG. 2. — *Alainodromia timorensis* n.sp., Holothuria Bank, HMS Penguin, 13°25'S - 126°00'E, 44 m, 1892: ♂ holotype 11.8 × 11.0 mm (BM 1998: 193); external surface of left cheliped. Scale bar: 2 mm.

tubercles. Carpus has two small tubercles on the superior border, two similar proximal tubercles, and two obtuse, distal tubercles on the outer face. Propodus especially long in male, outer face has six or seven small tubercles. Fingers strongly downcurved, gaping at base, cutting edges armed with six-seven small teeth, meeting at tips. Inner surface of fingers hollowed out and covered with a dense layer of setae which covers the gap between the fingers.

First two pairs of legs slightly smaller than chelipeds, margins of meri, carpi and propodi armed with a few prominent tubercles, surface otherwise finely granulate. Proximal and distal corners of carpi each have a large, rounded swelling. Dactyli shorter than propodi, inner margins have eight-nine well-developed spines, all of similar size.

Last two pairs of legs stout, reduced, but of similar length, fourth pair subdorsal, folded across posterolateral corners of carapace. Dactyli of both legs well-developed, strongly curved, distal border of propodi bearing single, small propodal spines. The tips of the dactyli are not directly opposable to the propodal spines. No spines on the outer propodal margin.

Abdomen of six free segments. Telson about as wide as long, posterior margin strongly concave with lateral corners produced as subacute lobes. Uropod plates absent. Abdominal locking mechanism consists of lateral projection from the penultimate abdominal segment fitting in front of a tubercle on base of first legs. Median ridge of abdomen strongly developed, giving a W-shape in cross section; on second-sixth seg-

ments there is a proximal pair of median tubercles followed by a single distal median tubercle, or ridge, with smaller lateral tubercles on each side. Thus each abdominal segment has five prominent tubercles. Besides the lateral tubercles involved in the abdominal locking mechanism, there is another similar, more distal tubercle following them. Lateral margins of other abdominal segments without tubercles. On the telson there are four small rounded tubercles arranged in a square.

First male pleopod with a semi-rolled, setose tube with sharp tip, second pleopod simple, needle-like. Genital papilla from coxa of last legs, soft and flexible, very long, reaching almost to the joint mid-way along the first male gonopod.

#### DISCUSSION

This new genus and species is based on four specimens collected from the Timor Sea at depths ranging from 27 to 44 m. Three specimens were



FIG. 3. — *Alainodromia timorensis* n.sp., Holothuria Bank, HMS Penguin, 13°25'S - 126°00'E, 44 m, 1892: ♂ holotype 11.8 × 11.0 mm (BM 1998: 193); external surface of abdomen.

males and the other a female, but this animal, as well as one of the males, was infected with a sacculinid parasite. While the male appeared to have fully developed gonopods, the female pleopods were much smaller than might be expected. The two uninfected large males had well-developed chelipeds and gonopods, but the infected small male had smaller chelipeds suggesting that it had not yet passed the pubertal moult. Similarly, judging by the size of the abdomen, the female was also immature. Dromiids carrying sacculinid externa are not very common. The structure of the last two pairs of legs of *A. timorensis* suggests that it probably carries pieces of camouflage. Species of *Cryptodromia* mainly utilize pieces of sponge or ascidians to conceal their body, changing them regularly during intermoult periods (see McLay 1983).

#### *Lauridromia intermedia* (Laurie, 1906)

*Dromia intermedia* Laurie, 1906: 351. – Ihle 1913: 23, pl. 1, figs 1-3. – Sakai 1936: 10, pl. 6, fig. 1; 1976: 8, pl. 1, fig. 3. – Campbell 1971: 29.

*Lauridromia intermedia*. – McLay 1993: 146, fig. 15 d.

MATERIAL EXAMINED. — **Holothuria Bank.** HMS *Penguin*: 13°25'S - 126°00'E, 44 m, 1892: 1 ♀, 7.6 × 7.5 mm (BM 92: 3: 26: 226).

**Macclesfield Bank.** HMS ? *Egeria*, 15°40'N - 114°45'E, ? stn 64, 64-68 m, sand and coral, 1893: 3 ♂♂, 6.2 × 6.8, 7.9 × 7.7, 11.7 × 11.8 mm (BM 98: 8: 20).

#### DISCUSSION

A full description of *Lauridromia intermedia* can be found in McLay (1993). This is a widespread Indo-Pacific species and it has been recorded from Japan (Sakai 1976) and from the south coast of Timor (Ihle 1913). The above new records do not greatly extend the range of *L. intermedia*. All of these records lie within the known depth range (7-150 m).

#### *Dromidiopsis tridentata* Borradaile, 1903

*Dromidiopsis tridentatus* Borradaile, 1903: 576, pl. 33, fig. 2a.

*Dromidia australiensis* var. – de Man 1896: 372 (not *D. australiensis* Haswell, 1882).

*Dromidiopsis australiensis* – Borradaile 1900: 572.

*Dromidiopsis tridentata* – Balss 1934: 502. – Lewinsohn 1984: 97, fig. 1. – McLay 1993: 141, figs 4a-j, 16a-b.

MATERIAL EXAMINED. — **Macclesfield Bank.** HMS *Egeria*, 15°40'N - 114°45'E, 80 m, 1893: 1 ♀, 8.9 × 9.8 mm (soft) (BM 1893: 11: 3: 264).

#### DISCUSSION

*Dromidiopsis tridentata* has been fully described by McLay (1993). The known distribution of this species extends from India through Indonesia to New Caledonia and the Fiji Islands. Thus this record from the Macclesfield Bank extends the range of *D. tridentata* into the China Sea. In the review of the genus *Dromidiopsis* Borradaile, 1900 by McLay (1993) attention was drawn to the anomalous record of Sakai (1976) of *D. abrolhensis* Montgomery, 1931 [a synonym of *D. australiensis* (Haswell, 1882)] from Japan. Lewinsohn (1984) investigated the use of the name *D. tridentata* and showed that many of the supposed records of *D. australiensis* were in fact of the former species. Thus it now seems likely that Sakai probably had a specimen of *D. tridentata* and that the range of this species probably also includes Japan.

#### *Petalomera granulata* Stimpson, 1858

*Petalomera granulata* Stimpson, 1858: 240; 1907: 179, pl. 21, fig. 4. – Alcock 1901: 78 (list). – Ihle 1913: 48 (key), 91 (list). – Gordon 1931: 526 (list). – Sakai 1936: 37, pl. 1, fig. 3, text fig. 10 a-c; 1965: 10, pl. 5, fig. 1; 1976: 25, pl. 4, fig. 4. – Suzuki & Kurata 1967: 95 (list). – Yamaguchi *et al.* 1987: 7, pl. 1, fig. 5. – Dai & Yang 1991: 25, pls 2-3, fig. 7, 1-3.

*Petalomera granulata* var. *indica* Alcock, 1899: 148. – Urita 1926: 1.

*Petalomera indica* – Alcock 1901: 55, pl. 3, fig. 14, 14a. – Ihle 1913: 48 (key), 91 (list).

Not *Petalomera granulata* – Shen 1932: 3, pl. 1, figs 9-10, text figs 1-3 (= *Paradromia japonica* Henderson, 1888).

MATERIAL EXAMINED. — **Holothuria Bank.** HMS *Penguin*: 13°25'S - 126°00'E, no depth, 1892: 1 ♂, 8.5 × 9.3 mm, 1 ♀, 10.2 × 11.2 mm (BM 92: 3: 26: 213-214). — 69.6-71.5 m, 1892: 1 ♂, 7.8 × 8.5 mm (BM 92: 3: 26: 215). — 44 m, 1892: 1 ovig. ♀, 7.2 × 7.6 mm, 1 ♀, 9.0 × 9.8 mm (BM



92: 3: 26; 216-217). — 59 m, 1892: 1 ovig. ♀, 8.6 × 9.4 mm (BM 92: 3: 26; 218).

**Macclesfield Bank.** HMS *Egeria*, 15°40'N - 114°45'E, no depth, 1893: 1 ♂, 8.2 × 8.7 mm (BM 93: 11: 3: 21). — ? stn 64, 64-68 m, sand and coral, 1893: 6 ♂♂, 6.9 × 6.9, 7.2 × 7.8, 9.4 × 9.5, 9.9 × 10.4, 10.6 × 11.3, 11.5 × 11.7 mm, 2 ovig. ♀♀, 9.0 × 9.8, 15.6 × 15.4 mm (BM 98: 8: 20).

## DISCUSSION

McLay (1993) revised the genus *Petalomera* Stimpson, 1858, removing all of the species to other genera except for *P. pulchra* Miers, 1884 and *P. granulata* Stimpson, 1858 (the type species of the genus *Petalomera*). This imposed a much more restrictive definition on the genus, emphasizing the fact that the chelipeds and first two pairs of walking legs of these dromiids had petaloid meri (hence the generic name of *Petalomera*). During the nineteenth century, many species without this character were added to the genus at least partly because Borradaile (1903), in his generic revision, omitted petaloid meri from the definition of the genus. The concept of the genus then came to include any small dromiids with an epipod on the cheliped and a granular carapace. Until the revision by McLay (1993) a total of nineteen species had been added. Most of these species have now been assigned to the genera *Stimodromia* McLay, 1993, *Dromia* Weber, 1795, *Tunedromia* McLay, 1993, *Frodromia* McLay, 1993, and *Epigodromia* McLay, 1993. Through an oversight one species, *Petalomera acutidens* Sakai, 1983, was omitted. This species should be known as *Epigodromia acutidens* (Sakai, 1983) because it does not conform to the strict definition of the original genus.

The only other name under which *Petalomera granulata* has been known is *P. indica* Alcock, 1901. This species was synonymized with *P. granulata* Stimpson, 1858 by Sakai (1965).

*P. granulata* is known from Kagoshima, Japan (the type locality), China (Dai & Yang 1991), Indonesia and Northern Australia (McLay 1993) and the Andaman Islands and Sri Lanka (Alcock 1901, as *P. indica*). Thus the records of *P. granulata* from the Macclesfield and Holothuria Banks does not really extend the range of this species. The previously known depth range for *P. granu-*

*lata* was 30-80 m, so the new records (44-70 m) do not extend this range.

The occurrence of ovigerous females provides new information about the reproduction of *P. granulata*: egg numbers ranged from 80 (CW 7.2 mm) to 760 (CW 15.6 mm), and the mean egg diameter was 0.77 mm. The comparable data for *P. pulchra* are 120 to 1278 eggs (CW 6.7 to 19.9 mm) with a mean egg diameter of 0.7 mm (McLay 1993). Thus, the reproductive strategies of these two species are probably very similar. In *P. pulchra* the female pubertal moult occurs over a comparatively wide size range (CW 6.7 to 11.8 mm) but whether the same phenomenon occurs in *P. granulata* is not clear because only six females [four ovigerous and two non-ovigerous (CW 9.0-10.2 mm)] were available. Unfortunately, the abdomen width of the non-ovigerous females was not measured.

## *Cryptodromiopsis bullifera* (Alcock, 1900)

*Dromia* (*Cryptodromia*) *bullifera* Alcock, 1900: 143.

*Cryptodromia bullifera* — Ihle 1913: 40. — Sakai 1936: 23, pl. 7, fig. 3; 1976: 16, text fig. 8. — Ward 1941: 1.

*Cryptodromiopsis bullifera* — McLay 1993, 189, fig. 17 c.

**MATERIAL EXAMINED.** — **Holothuria Bank.** HMS *Penguin*: 13°25'S -126°00'E, 69.6-71.5 m, 1892: 2 ovig. ♀♀, 5.2 × 4.9, 6.4 × 6.3 mm (BM 92: 3: 26; 220-221). — 97 m, 1892: 1 ♂, 7.7 × 7.7 mm (BM 92: 3: 26; 222).

**Macclesfield Bank.** HMS *Penguin*: 15°40'N - 114°45'E, 55-92 m, 1892: 1 ♂, 4.5 × 4.3 mm (sponge cap) (BM 1984: 523). — ? stn 64, 64-68 m, sand and coral, 1893: 1 ovig. ♀, 6.1 × 6.0 mm (BM 1984: 516).

## DISCUSSION

*Cryptodromiopsis bullifera* has been fully described by McLay (1993). Its distribution ranges from the Red Sea to the Philippine Islands and north to Japan. Therefore the new records do not extend the known range for this species, McLay (1993) concluded that the depth range for *C. bullifera* was from 0-60 m, but one of the specimens from the Holothuria Bank came from 97 m (53 fathoms). This small male extends the lower depth limit to almost 100 m.



All of the female specimens reported here were ovigerous and they provide the first information about the reproduction of *C. bullifera*. The females were all of a similar size and the number of eggs ranged from thirty to sixty, with a mean egg size of 0.7 mm. As noted by McLay (1993), this species reaches maturity at a very small size (CW 5.0 mm). The egg size for *C. bullifera* is similar to that of *C. unidentata* (0.75–1.10 mm) but this species does not reach sexual maturity until they ate about CW 11.0 mm. Not surprisingly, egg numbers (range 216–440, mean 331) are higher for *C. unidentata*.

One of specimens reported by McLay (1993) carried a compound ascidian cap and the present collection includes a small male carrying a sponge cap. Thus *C. bullifera* seems to use similar camouflage material to other small dromiids.

*Cryptodromiopsis unidentata*  
(Ruppell, 1830)

*Dromia unidentata* Ruppell, 1830: 16, pl. 4, fig. 2, 2a, pl. 5, fig. 9.

*Dromidia unidentata* – Nobili 1903: 23. – Rathbun 1910: 367. – Ihle 1913: 31. – Sakai 1936: 13, pl. 6, fig. 2, text fig. 2; 1976: 11, pl. 2, fig. 2, text fig. 2 a-b.

*Cryptodromia unilobata* Campbell *et* Stephenson, 1970: 240, fig. 2A-1.

*Cryptodromiopsis unidentata* – McLay 1993: 192, figs 7 a-k, 18 a.

MATERIAL EXAMINED. — **Macclesfield Bank.** HMS *Egeria*, 15°40'N - 114°45'E, 46 m, 1893: 1 ♂, 6.4 × 6.6 mm (sponge cap) (BM 1893: 11: 3: 263).

DISCUSSION

*Cryptodromiopsis unidentata* has been fully described and figured by McLay (1993). It is a very widespread species from the Red Sea and coast of Africa through the Indian Ocean to the Pacific where it occurs as far south as the Kermadec Islands, north of New Zealand, as far north as Japan, and to the east as far as Hawaii and Easter Island. Thus the occurrence of *C. unidentata* on the Macclesfield Bank is not surprising.

Among the Dromiidae, *C. unidentata* has the most catholic tastes when it comes to camouflage: it has been recorded as carrying pieces of a variety of sponges, both compound and solitary ascidi-

dians, as well as actinaria (McLay 1993). The specimen from the Macclesfield Bank was carrying a piece of sponge.

*Cryptodromia hilgendorfi* de Man, 1888

*Cryptodromia hilgendorfi* de Man, 1888: 404, pl. 18, fig. 3. – Borradaile 1900: 571. – Ihle 1913: 45. – Buitendijk 1939: 224. – Takeda 1973: 78. – Campbell & Stephenson 1970: 245, fig. 3 A-C. – Rodgers & Olerod 1988: 303. – McLay 1982: 317; 1993: 205, fig. 18 d. – Dai & Yang 1991: 24, pl. 2 (2), fig. 6 B.

MATERIAL EXAMINED. — **Macclesfield Bank.** HMS *Penguin*, 15°40'N - 114°45'E, 55–92 m, 1892: 1 ♂, 5.5 × 5.3 mm (sponge cap), 1 ♀, 5.8 × 5.4 mm (sponge cap, BM 1998: 195–196). — HMS *Egeria*, 15°40'N - 114°45'E, 80 m, 1893: 1 ♂, 6.9 × 6.1 mm (sponge cap) (BM 1893: 11: 3: 194).

DISCUSSION

*Cryptodromia hilgendorfi* has been figured by McLay (1993) and by Campbell & Stephenson (1970) who include an illustration of the first male pleopod (see also Dai & Yang 1991). This is a widespread Indo-Pacific species that has already been recorded from the coast of China by Dai & Yang (1991). Both specimens from the Macclesfield Bank were carrying sponges which is typical for *C. hilgendorfi*. The only detailed study of the camouflage behaviour of any dromiid was carried out in Moreton Bay, Australia (McLay 1983). Here *C. hilgendorfi* used at least twelve different sponges as well as three ascidians for camouflage. Both of the Macclesfield Bank specimens came from near the known lower depth limit of this species (range 0–88 m).

*Epigodromia areolata* (Ihle, 1913)

*Cryptodromia areolata* Ihle, 1913: 47, pl. 2, figs 10–11. – Sakai 1936: pl. 1, fig. 1; 1965: 8, pl. 3, fig. 4; 1976: 17, pl. 4, fig. 2. – Takeda & Miyake 1970: 202; 1972: 66. – Campbell 1971: 29. – Serene & Lohavanijaya 1973: 18, pl. 2A, figs 5–7. – Dai & Yang 1991: 25, pl. 1 (8).

*Epigodromia areolata* – McLay 1993: 217, fig. 19 e-f.

MATERIAL EXAMINED. — **Macclesfield Bank.** HMS *Egeria*, 15°40'N - 114°45'E, 132 m, 1893: 1 ♂, 12.0 × 11.6 mm (BM 93: 11: 5: 262).

## DISCUSSION

*Epigodromia areolata* has been illustrated by Ihle (1913), Sakai (1976), and McLay (1993), while the male pleopod has been figured by Serene & Lohvanijaya (1973). A feature of this species is that males have much larger chelipeds than females of the same size. This species has proved to be abundant in collections from Japan and the South China Sea (Takeda & Miyake 1972). *E. areolata* is only known from a fairly narrow latitudinal band from Japan in the north to New Caledonia in the south. The maximum size for a male of this species is CW 12.3 mm, so the Macclesfield Bank specimen is near the upper limit. This specimen also lies within the known depth range of 30–350 m.

In the review by McLay (1993) of *Epigodromia* McLay, 1993, one species, which belongs in this genus, was overlooked. *Petalomera acutidens* Sakai, 1983, from Japan, should be known as *Epigodromia acutidens* (Sakai, 1983). In this species the anterolateral margin is armed with five or six sharp teeth. This brings to ten the number of species of *Epigodromia*.

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